

WHAT IS CLAIMED IS:

1. A proportional valve having a valve element  
whose lift amount varies in proportion to a current value,  
5 characterized by comprising:

a piston arranged on one side of a valve seat  
opposite the valve element and movable together with the  
valve element, the piston receiving a pressure equal to a  
fluid pressure applied to the valve element from an  
10 upstream side thereof in a valve closing direction, to  
urge the valve element in a valve opening direction; and

a diaphragm arranged at a pressure receiving  
portion of the piston, for varying a pressure receiving  
area of the pressure receiving portion in accordance with  
15 the lift amount of the valve element.

2. The proportional valve according to claim 1,  
characterized in that when the valve element is in a  
seated position, the diaphragm is in a displaced state  
20 such that the pressure receiving area is at a maximum.

3. The proportional valve according to claim 1,  
characterized in that a chamber whose internal pressure  
acts upon the diaphragm communicates with an inlet port  
25 through a passage formed in a body.

4. The proportional valve according to claim 3,

characterized in that the diaphragm has an outer peripheral portion secured to the body so as to seal a cylinder slidably receiving the piston.

5           5. The proportional valve according to claim 1, characterized in that a chamber whose internal pressure acts upon the diaphragm communicates with a chamber on an upstream side of the valve element, through a passage extending through the diaphragm and the valve element.

10           6. The proportional valve according to claim 5, characterized in that the diaphragm has an outer peripheral portion secured to a body so as to seal a portion slidably receiving the piston, and has an inner  
15 peripheral portion secured to the piston.